wonder why such an insignificant habit should be so tenacious in a tribe so long in contact with the whites and so much affected by their civilization in much more important particulars as the Passamaquoddies.

It is conceivable that gestures like this certainly, spontaneous and in some respects involuntary, may furnish data of ethnological value.— J. WALTER FEWKES, *Boston, January 10th, 1891.*

## MICROSCROPY.[1]

**Methods for the Preservation of Pelagic Organisms.**—The publication of the methods for the preservation of marine animals employed at the Naples Station[2] has called forth another contribution on the subject from Benedict Friedländer.[3]

Kleinenberg discovered some time since that picrosulphuric acid gave the best results with marine larvæ when it contained about 2 per cent. of common salt. Friedländer experimented on Hydromedusæ and Ctenophores with regard to this point, by placing some individuals in 1 per cent chromic acid, and others, of the same species, in an equal volume of the same solution, to which 2–3 per cent. of salt had been added; the results declared unmistakably in favor of the latter reagent. Still better results were obtained by fixing the specimens in a solution prepared by adding sea-water to a 30–40 per cent. solution of chromic acid until it was reduced to a ½–1 per cent. solution, the animals being exposed to its action for about an hour. An objection to the method lies in the fact that there is a danger of crystals of calcium sulphate separating out in the tissues when the specimens are transferred to alcohol. If the salts contained in the tissues are thoroughly washed out before the transfer, there will, on the other hand, be a shrinkage.

Friedländer obtained his best results by the prolonged action (5–10 hours) of an abundant quantity of 30 per cent. alcohol, followed by 50 per cent., 60 per cent., and 70 per cent. He concludes that a neither too rapid nor too slow extraction of the salts contained in gelatinous animals is more important for the prevention of shrinkage than the use of any fixatives. From many Medusæ, Salpæ, Siphonophores, etc., the salts can be more or less extracted before treatment with

[1] Edited by C. O. Whitman, Clark University. Worcester, Mass.

[2] See AMERICAN NATURALIST for September, 1890.

[3] *Biolog. Centralblatt.* Bd. X., Nos. 15–16.

alcohol by the action of fresh water, or a solution of chromic acid in distilled water. A trace of hydrochloric or nitric acid added to the alcohol dissolves some crystal deposits, but not those produced by calcium sulphate.

The greatest obstacle in the way of obtaining satisfactory preparations of Siphonophores is the tendency to split up into fragments which many of them, especially those with nectocalyces, show. Friedländer experimented with various salts in an attempt to discover a reagent which would kill without producing fragmentation, and obtained the best results with ammonia, zinc sulphate, and copper sulphate. The first of these reagents is, however, unsatisfactory for other reasons.

An interesting observation in connection with the use of these reagents is, that to obtain good results the reagent must have a certain minimal concentration; below this fragmentation occurs, increasing in intensity with the weakness of the reagent. This does not seem to depend on the rapid killing or fixation of the tissues by the strongest solutions, since such reagents as concentrated corrosive sublimate and strong nitric or acetic acids are much more rapid in their action than 15 per cent. copper or zinc sulphate, and yet produce excessive fragmentation.

The following method of preservation is recommended for the Siphonophores. The vessel which contains the animal in sea-water is held in a tilted position, so that the water is almost at the brim on one side. A solution composed of

| | |
|---|---|
| Fresh water . . . . . | 1000 parts. |
| Zinc sulphate . . . . . | 125 " |
| Copper sulphate . . . . . | 125 " |

is then poured in somewhat gradually, so that it may mix equally with the sea-water. The amount of the reagent to be used varies with the species under treatment. For instance, with Physophora it should be of about equal volume with the sea-water; but for Forskalia, which has numerous nectocalyces, it should be at least double that volume.

After the animal is completely dead, it should be placed in a fixing solution, for which Friedländer recommends 1 per cent. chromic acid in sea-water, with the addition for more delicate forms of strong osmic acid, or else $\frac{1}{5}$ per cent. osmic acid alone may be used.

Before transferring to alcohol the animal should be allowed to slip (the nectocalyces going first) into a glass tube, open only at one end. This opening should be plugged with cotton, and the tube suspended, the

open end downwards, in 50 per cent. alcohol. In about 12 hours the chromic acid will have been extracted, and the tube is then transferred for another 12 hours to 80–90 per cent. alcohol.

Finally, to get rid of the air-bubbles which sometimes form in the cavities of the nectocalyces, it is recommended that the specimen, before being placed in alcohol, should be transferred for a time to well-boiled sea-water, so that the air contained in the tissues may, to a certain extent, be dissolved out.—J. PLAYFAIR MCMURRICH.

## PROCEEDINGS OF SCIENTIFIC SOCIETIES.

**The Western Society of Naturalists** held its annual meeting Nov. 12th and 13th, 1890, in the Physical Laboratory of Purdue University, Lafayette, Ind. In the absence of the president, Prof. C. R. Barnes occupied the chair. The report of the treasurer showed a balance on hand of $36.70. The presidential address by Chancellor C. E. Bessey dealt with "General Culture as an Object in Teaching Science." The society then discussed, "What science, and how much science, shall be required for entrance to college classes?" The general conclusion was that it did not much matter what science was required so long as it was well taught in the preparatory schools, but that none was better than that which is usually offered. Dr. D. H. Campbell gave an account of "Some Histological Methods in Botany." He usually killed and hardened vegetable tissues by immersion for from four to twenty-four hours in 1 per cent. chromic acid, stained *in toto* with some nuclear stain, cut by the paraffin method, and then stained again on the slide with Bismarck brown in 70 per cent. alcohol. This brings out the nucleus and the cell-wall in a beautiful manner. Turpentine is better for plant-tissues than chloroform, while a solution of Bismarck brown in turpentine stains too diffusely. Professor Hargitt exhibited a warm stage of his own construction, and described his method o making permanent mounts of Infusoria. He killed the specimens with Lang's fluid and stained with borax carmine. Dr. Kingsley described a new method of making serial sections with celloidin. Many of the same points are contained in a paper by A. C. Eyclesheimer in the *Botanical Gazette*, Vol. XV., p. 291, 1890. Prof. O. P. Jenkins described a lens support and directed attention to the Urodeles as affording excellent material for the demonstration of muscle growth. He also recommended the beetle Dytiscus for exhibiting the phenomena